

REMARKS

Claims 1, 3-8, 10-15, and 17-25 are all of the claims presently pending in the application. Claims 1, 3-8, 10-13, 15 and 17 have been amended to more particularly define the invention. Claims 21-25 have been added to claim additional features of the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1, 3-8, 10-15 and 17 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1 and 3-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa et al. (U.S. Patent No. 6,116,055) (hereinafter "Ishikawa"). Claims 8, 10-15 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Antos et al. (U.S. Patent No. 6,289,698) (hereinafter "Antos").

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention of exemplary claim 1, provides a method for sintering a porous glass-material having a core inside the porous-glass material, wherein the range of

the outer diameter(d) of the porous-glass material is within a range of $0.5xD < d < 0.9xD$

(e.g., see Application at page 9, line 24 through page 10, line 31). This feature is important for ensuring uniform vitrification in the radial direction of the porous-glass material (see Application at page 9, lines 30-33).

II. THE INDEFINITENESS REJECTION

The Examiner has rejected claims 1, 3-8, 10-15 and 17 as allegedly being indefinite. Applicants submit that the claims have been amended to more particularly define the claimed invention.

Specifically, all instances of the term “predetermined” have been deleted from the claims.

Additionally, claims 6 and 7 have been amended to provide proper antecedent basis for all of the claim limitations.

Furthermore, claim 13 has been amended to recite “*an eccentricity of a core inside said sintered porous-glass material is substantially 0.4% of less*”.

In view of the above, the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. THE PRIOR ART REFERENCES

A. The Ishikawa Reference

The Examiner alleges that the claimed invention of claims 1 and 3-7 would have been obvious in view of Ishikawa. Applicants submit, however, that there are elements

of the claimed invention which are neither taught nor suggested by, nor would have been obvious in view of, Ishikawa.

That is, Ishikawa does not teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, wherein “*said predetermined range of said outer diameter (d) of said porous-glass material is within $0.5xD < d < 0.9xD$* ” as recited in claim 1, and similarly recited in claims 8 and 15.

Applicants have amended claim 1, and similarly claims 8 and 15 to remove the term “comprises”. As indicated above, the claimed invention recites that the range of the outer diameter is within $0.5xD < d < 0.9xD$, which excludes any other values or ranges outside of the range of $0.5xD < d < 0.9xD$. Thus, the ratio of 0.93, allegedly disclosed by Ishikawa is clearly excluded from the claimed range.

The Examiner, however, continues to maintain this claimed range would have been obvious in view of Ishikawa. Applicants submit, however, that the Examiner has clearly failed to establish a *prima facie* case of obviousness.

That is, as the Examiner is well aware, in order to establish a *prima facie* case of obviousness, “there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings” (see M.P.E.P. §2142).

Additionally, to support a conclusion that a claimed invention is indeed obvious, the Examiner “must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references” (see M.P.E.P. §2142). The Examiner has failed to present a convincing line of reasoning.

Indeed, the Examiner merely alleges that “Applicant admits that (d) cannot work if it is less than 0.5D. That means the inherent workable range is 0.5D to 1.0D(because d cannot be larger than D. Therefore, the 0.5-0.9 range does not define over the necessary workable ranges of 0.5-1.0” (see Office Action dated April 19, 2006 at page 5). The Examiner, however, is clearly incorrect.

Applicants submit that a response to his clearly erroneous and unsupported argument has previously been provided. However, to provide a complete record, Applicants again point out that, while Ishikawa may be presumed to be enabled for its intended purpose, it is merely enabled for solving the specific problems recognized in Ishikawa (i.e., the intended purpose of Ishikawa, not the intended purpose of the claimed invention). Specifically, Ishikawa is merely enabled for drawing an optical fiber having a low transmission loss (see Ishikawa at column 2, lines 3-7). Therefore, Applicants again point out that the Examiner’s argument above is clearly without merit.

Even assuming, however, that the Examiner has established a *prima facie* case of obviousness, Applicants provide the following evidence and test data to demonstrate the importance (and unexpected superior results) of the claimed range (Applicants submit the following test data prepared by the inventors in the Research and Development Division of Shin-Etsu Chemical Co., Ltd.). Furthermore, Applicants concurrently file herewith a Declaration under 35 U.S.C. § 1.132 to accompany the submitted evidence.

A porous-glass material having an outer diameter d mm, shown in the table below, and a length of 3000 mm was vitrified using the sintering apparatus (shown in Figure 1 of the present application) in the same method indicated in the Examples of the specification (e.g., see Application at pages 13-16). In performing the test, 50 test pieces

(porous-glass material) were used in tests numbers 1-4. The test results are provided in the following table.

| Test No. | d (mm) | D (mm) | D/d | Number of test pieces of which surface was not damaged. | Number of test pieces of which surface was damaged. | Number of test pieces caused damage to the furnace. |
|----------|--------|--------|------|---|---|---|
| 1 | 350 | 400 | 0.88 | 50 | 0 | 0 |
| 2 | 360 | 400 | 0.90 | 50 | 0 | 0 |
| 3 | 370 | 400 | 0.93 | 34 | 16 | 0 |
| 4 | 380 | 400 | 0.95 | 0 | 50 | 3 |

In the cases where $d/D < 0.9$ (tests numbers 1 and 2), the surface of the porous-glass material is not damaged even though the porous-glass material rotates and swings to one specific direction in a furnace. This is because a porous-glass material does not contact with a sidewall of the furnace since there is sufficient space between the porous-glass material and the sidewall of the furnace. As shown in the table above, none of the 50 pieces had surfaces that were damaged.

In the cases where $d/D > 0.9$ (test numbers 3 and 4), a lower part of the surface of a porous-glass material is damaged when the porous-glass material rotates and swings to one specific direction in the furnace. This is because a lower part of the porous-glass material of which a side is not held by a rotation mechanism of the furnace contacts with

a sidewall of the furnace, since there is not sufficient space between the porous-glass material and the sidewall of the furnace.

As shown in the table above, in the case where $d/D=0.93$ (test number 3, which is the same ratio of d/D as is disclosed in Ishikawa), 16 test pieces out of 50 resulted in asperity of the surface of the porous-glass material, which was caused by peeling of the surface of the porous-glass material and a broken piece of the damaged portion of the furnace becoming adhered to the surface of the porous-glass material.

Additionally, in the case where $d/D=0.95$ (test number 4), all of the 50 test pieces resulted in the same drawback as that of test number 3. Furthermore, in executing the test, the furnace was broken three times by contacting a porous-glass test piece.

Therefore, Applicants respectfully submit that the range recited in claim 1 (and similarly recited in claims 8 and 15) is clearly important and has not been arbitrarily selected as alleged by the Examiner and indeed has provided unexpectedly superior results over the closest prior art of record.

Therefore, Applicants submit that the claimed invention recites features that are not obvious in view of Ishikawa. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

B. The Antos Reference

The Examiner alleges that Antos would have been combined with Ishikawa to form the claimed invention of claims 8, 10-15 and 17. Applicants submit, however, that even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention.

That is, neither Ishikawa nor Antos, nor any combination thereof, teaches or suggests that “*said predetermined range of said outer diameter (d) of said porous-glass material is within $0.5xD < d < 0.9xD$* ” as recited in claim 1 and similarly recited in claims 8 and 15.

As detailed in section A, above, Ishikawa does not teach or suggest this feature. Furthermore, Applicants respectfully submit that Antos fails to make up the deficiencies of Ishikawa.

The Examiner attempts to rely on column 4, lines 5-34 of Antos to support his allegations.

Nowhere, however, in this passage (nor anywhere else for that matter) does Antos teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, wherein the predetermined range of <the outer diameter(d) of the porous-glass material is within $0.5xD < d < 0.9xD$. Indeed, the Examiner does not even allege that Antos teaches or suggests this feature. The Examiner merely relies upon Antos as teaching that it is known to stretch preforms to reduce bubbles.

Thus, Antos clearly fails to make up for the deficiencies of Ishikawa.

Therefore, Applicants respectfully submit that even if combined, the alleged combination of features does not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV. FORMAL MATTERS AND CONCLUSION

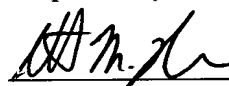
In view of the foregoing, Applicants submit that claims 1, 3-8, 10-15 and 17-25, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

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Respectfully Submitted,



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